REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-2, 4-5, and 7-8 are pending.

In the outstanding Official Action, Claims 1-2, 4-5, and 7-8 were rejected under 35 U.S.C. § 102(e) as unpatentable over U.S. Patent No. 6,353,201 to Yamakoshi et al. (hereinafter Yamakoshi '201); and Claims 1-2, 4-5, and 7-8 were rejected under 35 U.S.C. § 102(e) as unpatentable over U.S. Application Publication No. 2001/0021422 to Yamakoshi et al. (hereinafter Yamakoshi 2001).[1]

Applicants traverse the rejection of Claim 1 under 35 U.S.C. § 102(e) over Yamakoshi '201.

Claim 1 is directed to a radio frequency power supply structure for use in a device generating plasma. The structure has a plate-like electrode forming a longitudinal grid facing an earth electrode having two lateral electrodes, where the longitudinal electrodes are arranged to connect to the lateral electrodes. Claim 1 recites that "a core cable of said RF cable connects to said plate-like electrode so as to form a smoothly curved continuous surface at a connecting portion provided between the core cable of the RF cable and the plate-like electrode."

The present inventors recognize that connecting to the lateral electrode by forming a smoothly curved continuous surface, a sudden change of impedance due to a discontinuous change of the power stream passage can be avoided and a reflection of the radio frequency power can be further reduced.[2]

Fig. 1 of Yamakoshi '201 describes a power supply portion of a ladder electrode in which power is supplied to at least two points on the ladder electrode. As shown in Fig. 1, a

[1] The outstanding Official Action of December 20, 2006 indicates that Claim 6 was rejected. However, Claim 6 was previously canceled.
[2] See specification at page 17, lines 7 to 13.

ladder electrode 11 of a vapor deposition apparatus is configured such that a plurality of electrode bars 12a are arranged in parallel with each other, and electrode bars 12b and 12c are connected to the corresponding opposite ends of the electrode bars 12a, thereby forming a ladder-like electrode. Power supply points 13 (13-1 to 13-4) are arranged axisymmetrically with respect to a reference line 14, which bisects one side of the RF discharge electrode 11, while being spaced a predetermined distance from the reference line 14. A coaxial cable 15 is used as a power transmission line. RF power is supplied to the power supply points 13-1 to 13-4 from an RF power source 16 through the coaxial cable 15 and a matching unit 17. The RF power source 16 supplies power to the four power supply points 13 (13-1 to 13-4) on the ladder electrode 11 through the matching unit 17 and the coaxial cable 15.[3]

Figs. 15 and 16 of Yamakoshi '201 describe a second embodiment of the ladder electrode. In a film deposition apparatus using plasma generated at a VHF frequency band, the transmission line (for example, *the coaxial cable 15*) is connected to a power supply portion of the ladder electrode 11 such that an *uninsulated bare metallic connector 101* for connecting the power supply point 13 on the ladder electrode 11 and a power line (for example, the core conductor of the coaxial cable 15) of the transmission line (for example, the coaxial cable 15) has a diameter at least equal to that of the electrode bar 12a as measured in the vicinity of the power supply portion.[4]

Claim 1 is distinguishable over Yamakoshi '201 as the applied reference fails to disclose or suggest *a core cable of a RF cable connecting to a plate-like electrode.* Figure 15 of Yamakoshi '201 illustrates that the coaxial cable 15 connects to the electrode bar 12b via a metallic connector 101. First, Yamakoshi '201 fails to disclose or suggest the coaxial cable 15 having *a core cable.* Second, assuming *arguendo* that coaxial cable 15 has a core cable, a

[3] See Yamakoshi '201 at column 11, lines 34-59.
[4] See Yamakoshi '201 at column 12 line 55 to column 13, line 3.

core cable of coaxial cable 15 ***cannot*** connect to the electrode bar 12b since the metallic connector 101 connects the coaxial cable 15 to the electrode bar 12b.

Claim 1 is further distinguishable over Yamakoshi '201 as the applied reference fails to disclose or suggest a core cable of a RF cable connecting to a plate-like electrode *so as to form a smoothly curved continuous surface at a connecting portion provided between the core cable of the RF cable and the plate-like electrode.* The outstanding Official Action identifies Figure 15 of Yamakoshi '201 as describing this feature.[5] However, as discussed above, Figures 15 and 16 of Yamakoshi '201 illustrate that the RF cable (coaxial cable 15) makes no direct contact with the plate-like electrode (electrode bar 12b), but instead connects to the electrode via the metallic connector 101. The connecting portion between the metallic connector 101 and the electrode bar 12b, as illustrated, is formed by both of these components being butt-jointed at the power supply point 13 and fixed together by the screw 102. Thus, a *smoothly curved continuous surface at a connecting portion provided between* the coaxial cable 15 and ladder electrode bar 12b is ***not formed.***

Accordingly, Applicants submit that Yamakoshi '201 fails to disclose or suggest all the limitations of Claim 1. MPEP § 2131 notes that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Therefore, Applicants request that the rejection of Claim 1, and claims depending therefrom, under 35 U.S.C. § 102(e) over Yamakoshi '201 be withdrawn.

Applicants traverse the rejection of Claim 1 under 35 U.S.C. § 102(e) over Yamakoshi 2001.

[5] See Official Action of March 20, 2007 at page 3.

Fig. 15 of Yamakoshi 2001 illustrates a plasma CVD apparatus 1C having a vacuum chamber 2C for surrounding a substrate G, a ladder electrode 303 opposed to the substrate G in this vacuum chamber 2C, and a feeder circuit 8A for feeding power to this ladder electrode 303.[6] The ladder electrode 303, as a discharge electrode, is formed by assembling round rod electrode members at equal pitches into the form of a lattice. This ladder electrode 303 is connected to a feeder (central conductor) 6 of the circuit 8A by four feeding points 9a and 9b.[7]

Additionally, Figures 16 and 17 of Yamakoshi 2001 illustrate a feeder (central conductor) 6 passed through a *coaxial cable 61 and connected to the electrode 303* by the feeding points 9a and 9b. An insulator 63 is mounted on the end portion of the coaxial cable 61 by a coupling 62, thereby insulating the electrode 303 from the sheath of the cable 61. A plurality of holes 64 are formed in side portions of the insulator 63. A gas passage 66 in the coaxial cable 61 communicates with a gas supply source 68 and the holes 64 of the insulator. The gas supply source 68 contains industrially pure hydrogen gas H_2. This hydrogen gas is supplied from the gas supply source 68, passed through the gas passage 66 in the cable 61, and blown off from the side holes 64 and an upper-end hole 65, thereby blowing away a silane plasma existing at the feeding points 9a and 9b and its vicinity.[8]

Claim 1 is distinguishable over Yamakoshi 2001 as the applied reference fails to disclose or suggest a core cable of said RF cable connecting to a plate-like electrode so as to *form a smoothly curved continuous surface at a connecting portion provided between the core cable of the RF cable and the plate-like electrode.* The outstanding Official Action asserts that Figures 15-17 of Yamakoshi 2001 illustrate this feature. As discussed above, Figures 16 and 17 of Yamakoshi 2001 illustrate that a feeder 6 passes through the coaxial cable 61 to connect to the ladder electrode 303 at connecting portion 9a (9b). However,

[6] See Yamakoshi 2001 at paragraph [0185].
[7] See Yamakoshi 2001 at paragraph [0187].
[8] See Yamakoshi 2001 at paragraph [0191].

Yamakoshi 2001 neither discloses nor suggests that the surface of the connecting portion 9a between the feeder 6 and the lateral electrode is *smoothly curved.*

Additionally, at the connecting portion (feeding point 9a, 9b) between the feeder 6 and the lateral electrode 303, the feeder 6 connects to the lateral electrode 303 as if the feeder 6 *bumps against* the lateral electrode 303. Thus, a *smoothly curved continuous surface at a connecting portion provided between* the coaxial cable and feeding points 9a, 9b ***is not formed.***

Accordingly, Applicants submit that Yamakoshi 2001 fails to disclose or suggest all the limitations of Claim 1. MPEP § 2131 notes that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros.*, 814 F.2d at 631. Therefore, Applicants request that the rejection of Claim 1, and claims depending therefrom, under 35 U.S.C. § 102(e) over Yamakoshi 2001 be withdrawn.

Claim 7 recites that "an outer shell, functioning as earth, of said RF cable has a front end elongated to the position of said plate-like electrode at said connecting portion to form an elongated portion that covers said connecting portion."

The outstanding Official Action asserts that Figure 17 of Yamakoshi '201 recites this feature of Claim 7. Figure 17 of Yamakoshi '201 illustrates that the grounding shield 15a of the RF cable (coaxial cable 15) has its front end welded to the end ring 207 instead of *elongated to the position of the plate-like electrode (component electrode bar 12a).* While the grounding shield 15a electrically connects to the grounding shield 29 via the end ring 207, spring 208, box nut 209, and receptacle 203, the grounding shield 29 is arranged apart from the component electrode bar 12a. Yamakoshi '201 neither discloses nor suggests that the grounding shield 15a of the coaxial cable 15 is *elongated to the a position of the electrode bar 12a.*

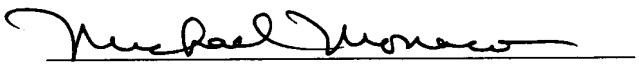
Additionally, in Yamakoshi '201, while the core conductor 205 of the coaxial cable 15 connects the component electrode bar 12a via the metallic conductor 201, the connecting portion thereof (portion A in Figure 17) is neither *covered by the grounding shield 15a nor by the grounding shield 29*. Therefore, Yamakoshi '201 fails to disclose or suggest all the limitations of claim 7. Accordingly, Applicants request that the rejection of Claim 7 under 35 U.S.C. § 102(e) over Yamakoshi '201 on this independent ground be withdrawn.

Although the outstanding Official Action asserts that Yamakoshi 2001 discloses all the features recited in Claim 7, the outstanding Official Action fails to address the portions of Yamakoshi 2001 that disclose or suggest the features recited in Claim 7. Accordingly, Applicants request that the rejection of Claim 7 under 35 U.S.C. § 102(e) over Yamakoshi 2001 be withdrawn.

Consequently, in view of the present response, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. A Notice of Allowance for Claims 1, 2, 4, 5, 7, and 8 is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Attorney of Record
Registration No. 25,599

Michael Monaco
Registration No. 52,041

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

GJM:MM:SP\la
I:\ATTY\SP\25'S\258285US\258285US-REQ.DOC